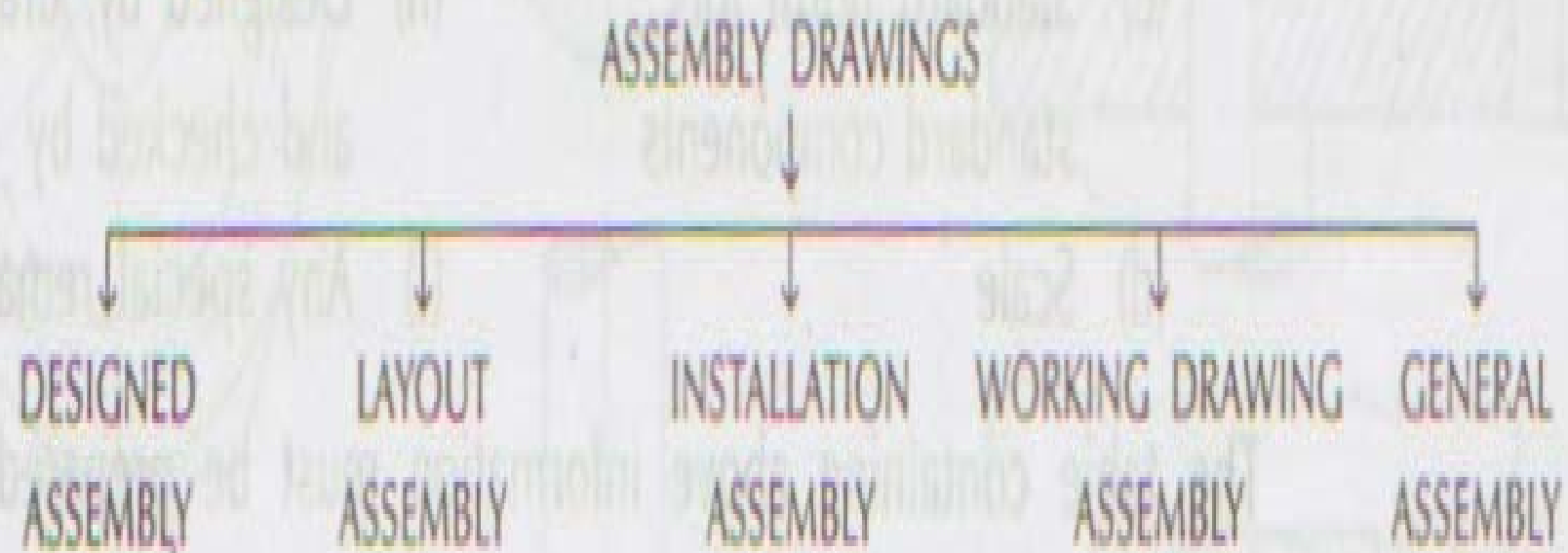


Assembly drawings

Introduction

- A drawing which displays the parts of a machine or a machine unit assembled in their relative working positions is known as assembly drawing.
- The assembly drawing would be such that it should satisfy: (i) Manufacturing requirements (ii) Operational requirements (iii) Maintenance requirements.

The assembly drawings are classified according to their use as shown below:



- Designed assembly: This assembly drawing is prepared at the design-stage on a larger scale.
- Layout assembly: This is an assembly drawing showing how the parts are assembled with their basic proportions (dimensions).
- Installation assembly: This is prepared for the installation or erection of a machine. This is also sometimes known as an outline assembly.

- Working drawing assembly: A complete set of working drawings of a machine comprises of detailed drawings, giving all necessary information for the production of individual parts and assembly drawing showing the location of each part. The assembly drawing should be ready before the detailed drawings are accepted as finished and the blue-prints are made.
- General assembly: It comprises of the detailed drawings of the individual parts, sub-assembly and the assembly drawings of the machine

Norms to be observed in preparing assembly drawings

- (i) Selection of views: The main or important view which is usually in section should show all the individual parts and their relative locations. Additional views are shown only when they add necessary information.
- (ii) Sectioning: The parts should be sectioned according to the requirements (i.e. half-section or partial section) to show important assembly details. Code of the BIS (SP:46-1988) for general engineering drawings must be observed

- (iii) Dotted lines: The dotted lines should be omitted from the assembly drawing when a proper section is taken. If the view of a part is drawn by the half-section, then in unsection portion of the view, the dotted lines may be drawn to clarify details of the part.
- (iv) Dimensions: The overall dimensions and centre-to-centre distances showing the relationship of parts to the machine as a whole, are sometimes shown.
- (V) Detailed dimensions are given on working assembly drawings when the detailed drawings are not prepared.

Bill of Materials

- Bill of materials: Each part of the machine is identified on assembly drawing by the leader line and number, which are used in the detail drawing and in the bill of material. The height of the number may be approximately 5 mm and encircled by 9 mm diameter. Leader lines are drawn radially touching the respective parts.
- The bill of materials also shows the following:
 - (a) Number of parts
 - (b) Material of parts required for one unit
 - (c) Standard norm for standard components
 - (d) Scale
 - (e) Method of projection
 - (f) Shop processes
 - (g) Name of the company
 - (h) Designed by, drawn by and checked by
 - (i) Any special remark.
- The table containing above information must be prepared as shown in the illustrative problems.

Suggested approach

- Preparing an assembly form exploded view is easy task as clue to the position and sequence is available
- For preparing from orthographic view of the individual components some skill is needed

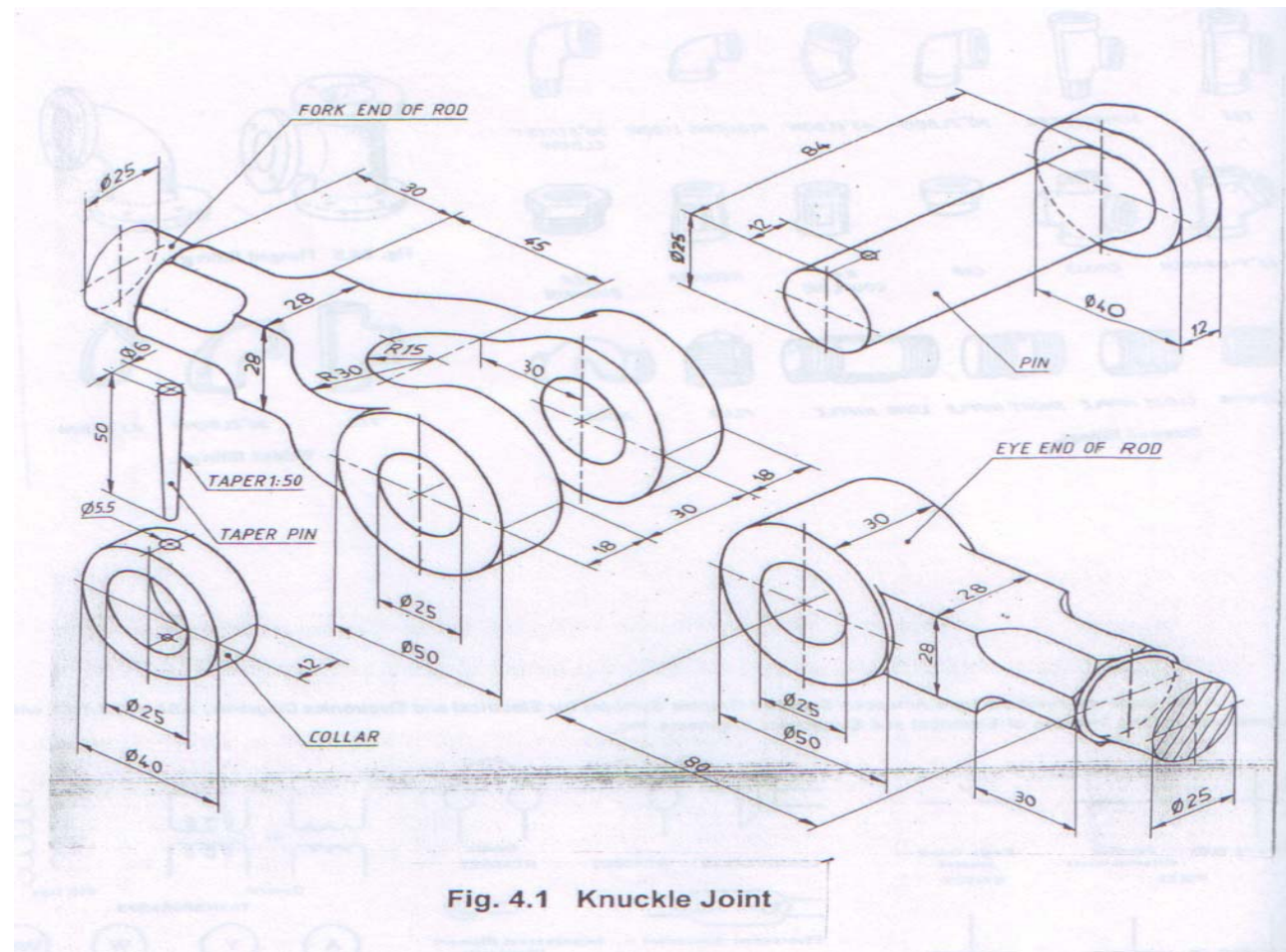


Fig. 4.1 Knuckle Joint

The suggested approach is

- Functional Matching or Mapping
- Geometrical mapping
- Dimensional mapping

Sequences of preparing the assembly drawing

- (i) Study functional requirements of each component and their inter relationship.
- Learn the actual working of a machine.
- (ii) Study carefully the views of each component in the detail drawing and decide the relative location of each part for the proper functioning of the machine.
- (iii) Decide the mating dimensions between two components which are required to be assembled.

- iv) Prepare free-hand sketch of the main view or an important view (generally front-elevation). Add additional views, if necessary.
- (v) Select a suitable scale for the entire assembly drawing.
- (vi) Lay out the views of the assembly drawing so that it become easier to understand.
- (vii) Prepare the bill of materials.
- (viii) Label each component by the leader-line and number it.
- (ix) Show overall dimensions.
- (x) Draw the section-lines according to the convention
- (xi) Show required fits and tolerances between the two mating components.